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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,045	04/15/2004	Jon Stuart Schoonmaker	193P014(A)	7409
28264 7590 06/05/2007 BOND, SCHOENECK & KING, PLLC ONE LINCOLN CENTER SYRACUSE, NY 13202-1355			EXAMINER EGAN, SCOTT T	
			ART UNIT 2622	PAPER NUMBER
			MAIL DATE 06/05/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/825,045

Applicant(s)

SCHOONMAKER ET AL.

Examiner

Scott Egan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities:
  - a. The title of the disclosure reads "Turnable Image Sensor" and should read -Tunable Image Sensor- to be consistent with the rest of the disclosure.
  - b. On page 3 line 6 mention should be made of both figure 12A and 12B.
  - c. Paragraph [010], lines 2 and 3 reference numbers for the cutout portion should be changed to 24 and reference numbers for the notch should be changed to 25, currently they are both labeled as 26, which is not consistent with the drawings.
  - d. Throughout the disclosure imagers are referenced as both number 28 and 68 however the drawings do not show these numbers or identify the image sensors.
  - e. In paragraph [014], line 7 the word "tenus" should be changed to -terms-. Appropriate correction is required.

### ***Drawings***

2. The drawings are objected to because the specification refers to imagers 28 and 68 however the drawings do not include these numbers. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should

include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1-3, 5, and 10** are rejected under 35 U.S.C. 102(e) as being anticipated by Sonoda et al. (US 2002/0113888).

Consider **claim 1**, Sonoda et al. explicitly teaches:

A tunable imaging sensor, comprising:

a housing (housing is made up of lenses 301, support member 305, and mounting board 306, figure 3B);

a lens plate attached to a front of said housing (lenses 301 are considered a lens plate as seen in figure 3B);

a filter plate inside said housing adjacent said lens plate (paragraph [0044], lines 10-14);

a camera plate inside said housing adjacent said filter plate (substrate 104);

a plurality of imagers mounted on said camera plate (pixel groups 102a-102d);

a plurality of lenses mounted on said lens plate (lenses 301, figures 3A and 3B);

a plurality of filters mounted on said filter plate (paragraph [0044], lines 10-14);

said lens plate, said filter plate, and said camera plate being aligned such that radiation passing through one of said lenses passes through one of said plurality of filters onto one of said imagers (paragraph [0044], lines 1-14).

Consider **claim 2**, Sonoda et al. explicitly teaches:

A sensor according to claim 1, wherein said plurality of imagers consists of four imagers, said plurality of lenses consists of four lenses, and said plurality of filters consists of four filters (figures 3A and 3B paragraph [0044], lines 1-14).

Consider **claim 3**, Sonoda et al. explicitly teaches:

A sensor according to claim 2, wherein at least two of said four filters are each sensitive to a different wavelength of radiation (paragraph [0044], lines 10-14, each filter is sensitive to a color, which all have different wavelengths).

Consider **claim 5**, Sonoda et al. explicitly teaches:

A sensor according to claim 2, wherein said plurality of imagers are CMOS imagers (paragraph [0069], lines 1-3).

Consider **claim 10**, Sonoda et al. explicitly teaches:

A tunable imaging sensor system, comprising:

a housing (housing is made up of lenses 301, support member 305, and mounting board 306, figure 3B);

first means for mounting a plurality of lenses in said housing (lenses 301 are considered a lens plate as seen in figure 3B);

second means for mounting a plurality of filters adjacent said plurality of lenses in said housing (paragraph [0044], lines 10-14);

third means for mounting a plurality of imagers adjacent said plurality of filters in said housing (substrate 104 and pixel groups 102a-102d);

wherein said first means, said second means, and said third means are aligned such that radiation passing through one of said lenses passes through one of said plurality of filters onto one of said imagers (paragraph [0044], lines 1-14).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 4 and 6-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. in view of Ray et al. (US 2003/0147002).

Consider **claim 4**, Sonoda et al. explicitly teach a sensor according to claim 2 including 4 filters, which are sensitive to different wavelengths thus different types of radiation.

However, Sonoda et al. do not explicitly teach that they are sensitive to different forms of radiation.

In the same field of endeavor, Ray et al. teach an imaging system including four color filters. Ray et al. further teach that the four filters are infrared filter 62, red, green, and blue filters 63, 64, and 65, or two different types of radiation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the different types of radiation filters found in Ray et al. into the sensor found in Sonoda et al. in order to receive both a visible light image and a temperature charted image to learn more about the scene being captured.

Consider **claim 6**, Sonoda et al. explicitly teach a sensor according to claim 1 including a filter plate.

However, Sonoda et al. do not explicitly teach that the filters are rotatable so that a different filter can be aligned with a lens and imager.

In the same field of endeavor Ray et al. teach an imaging system including a filter plate with different filters mounted thereon. Ray et al. further teach that the color filter wheel 52 is rotatable (paragraph [0068], lines 16-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the color filter wheel found in Ray et al. into the sensor found in Sonoda et al. in order to provide the user with a higher resolution image as well as more information about the captured subject.

Consider **claim 7**, the combination of Sonoda et al. in view of Ray et al. as applied to claim 6 further teaches a sensor according to claim 6, wherein said plurality of imagers consists of four imagers (pixel groups 102a-102d, Sonoda et al.), said plurality of lenses consists of four lenses (lenses 301, fig 3A and 3B, Sonoda et al.).

However, the combination does not explicitly teach that there are 16 filters.

Official notice is taken that both the concept and the advantages of providing a filter wheel with 16 filters is well known and expected in the art. It would have been



obvious to one of ordinary skill in the art at the time the invention was made to include 16 filters in the filter wheel in order to provide the user with a wider variety of information on the subject, possibly including a higher resolution image or a color temperature mapping.

Consider **claim 8**, the combination of Sonoda et al. in view of Ray et al. as applied to claim 7 further teaches a sensor according to claim 7, wherein rotating said filter plate brings a different group of four filters into alignment with said plurality of lenses and said plurality of imagers (as seen in Ray et al. the filter wheel is rotatable (paragraph [0068], lines 16-20) and if integrated with Sonoda et al. a different combination of filters would be aligned with each pixel group 102a-102d).

Consider **claim 9**, the combination of Sonoda et al. in view of Ray et al. as applied to claim 7 further teaches, wherein said filter plate is connected to a shaft of a stepper motor (paragraph [0068], lines 20-23, Ray et al.).

5. **Claims 11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. in view of Kawada (US 6,640,002).

Consider **claim 11**, Sonoda et al. explicitly teach the system according to claim 10 including an interface with a computer which connects the image sensors to an external computer as seen in figure 16, external I/F unit 8.

However, Sonoda et al. do not explicitly teach that the computer that is interfaced with the image has a frame grabber.

In the same field of endeavor Kawada teaches an image processing system, which is a computer and could be interfaced to the sensor in Sonoda et al. Kawada

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further teaches that the image processing device 12 is a computer that includes frame grabber memories.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the computer found in Kawada as the interfaced computer found in Sonoda et al. in order to store and easily processes images in a fast and efficient manner.

Consider **claim 12**, the combination of Sonoda et al. in view of Kawada as applied to claim 11 further teaches a system according to claim 11, in which said computer includes means for processing said plurality of outputs from said plurality of imagers (processing unit 154, fig 13).

Consider **claim 13**, the combination of Sonoda et al. in view of Kawada teaches a system according to claim 12 including four imagers (pixel group 102a-102d) and four lenses (lenses 301).

However, the combination does not explicitly teach that there are 16 filters.

Official notice is taken that both the concept and the advantages of providing a filter wheel with 16 filters is well known and expected in the art. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include 16 filters in the filter wheel in order to provide the user with a wider variety of information on the subject, possibly including a higher resolution image or a color temperature mapping.

6. **Claims 14 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonoda et al. in view of Kawada as applied to claim 11 above, and further in view of Ray et al.

Consider **claim 14**, the combination of Sonoda et al. in view of Kawada teaches a system according to claim 13.

However, the combination does not explicitly teach that the filters can be rotated to align a different combination of filters with the image sensors.

In the same field of endeavor Ray et al. teach an imaging system including a filter plate with different filters mounted thereon. Ray et al. further teach that the color filter wheel 52 is rotatable (paragraph [0068], lines 16-20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the color filter wheel found in Ray et al. into the sensor found in Sonoda et al. in order to provide the user with a higher resolution image as well as more information about the captured subject.

Consider **claim 15**, the combination of Sonoda et al. in view of Kawada in further view of Ray et al. further teaches a system according to claim 14, wherein said second means is connected to a shaft of a stepper motor, and said stepper motor is controlled by said computer (paragraph [0068], lines 16-23 in Ray et al. explains the operation of the filter wheel which is controlled by a system controller, which could be inherently replaced by the computer).

**Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Yamazaki et al. (US 5,694,165) teaches a high definition image taking apparatus including four lenses four image sensors and filters used on the lenses.
- b. Yu et al. (US 6,611,289) teaches a digital camera with multiple sensors including four lenses and four CMOS sensors.
- c. Suda (US 6,833,873) teaches an image pickup apparatus with multiple lenses filters and image sensors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Egan whose telephone number is (571) 270-1452. The examiner can normally be reached on Monday-Friday 8:00 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SE



NGOC-YEN VU  
SUPERVISORY PATENT EXAMINER